medium appeared to be tinged with the same kind and number of colouring particles as the ordinary medium; but in other cases, in the same mineral, the extraordinary medium was either tinged with a different number of particles of the same colour, or with a colouring matter entirely different from that of the ordinary medium. In some specimens of topaz the colouring matter of the one medium was more easily discharged by heat than that of the other, one of the pencils being yellow and the other pink: hence it is a mistake to suppose that in converting yellow topazes into pink by heat, the former colour is changed into the latter; the fact being, that the yellow is discharged by heat, thus leaving the pink unimpaired. Hence it may be ascertained beforehand whether a topaz will receive a pink colour by heat; for if that colour exist in one of its images, seen by exposing it to a polarized ray, we may predict the success of the experiment.

In two specimens of emerald it was found that the colouring matter which tinged the ordinary medium in the one, tinged the extraordinary medium in the other, and *vice versâ*.

Observations sur la Décomposition de l'Amidon à la Température Atmosphérique par l'Action de l'Air et de l'Eau. *Par* Théodore de Saussure, *Professeur de Minéralogie dans l'Académie de Genève, Correspondant de l'Institut Royal de France, &c.* *Communicated by* Alexander Marcet, *M.D. F.R.S.* Read December 17, 1818. [*Phil. Trans.* 1819, *p.* 29.]

After some general observations on the changes which starch undergoes during the process of germination, and also when acted on by dilute sulphuric acid, in the manner contrived by M. Kirchoff, the author proceeds to show that starch alone, boiled in water and left to itself, forms, at the end of a certain time, a considerable portion of sugar, which is crystallizable, and much resembling that of M. Kirchoff. This change takes place at a temperature between 68° and 77° of Fahrenheit, with or without access of air. There is also produced, at the same time, a gum possessed of properties analogous to that procured by roasting starch, and a peculiar substance which M. de Saussure calls *Amidine*. There is also formed a body, insoluble in water and in most acids, but which agrees with starch in forming a blue compound with iodine.

When the air has free access in these experiments, water is abundantly formed, carbonic acid is evolved, and a portion of charcoal is deposited. When the solid contents of this solution are examined, they are found greatly inferior in weight to that of the original starch. The loss is referred principally to the formation of water, and only in small part to the carbon carried off in the form of carbonic acid.

When air is excluded, no water is produced. A little carbonic acid and nearly pure hydrogen are evolved, and no carbonaceous deposit ensues. Whether the presence or absence of air influences the production of sugar, the author has not been able to determine.

The particular characters of the gum amidine, and other products of the fermentation of starch, are described at length in notes annexed to this paper; in one of which the author remarks, that the fixation of the elements of water, in the treatment of animal and vegetable substances by the common principles of the laboratory, occurs more frequently than is generally believed; and shows, by a comparative analysis of hog's lard in its recent state and after saponification, that the new properties which oils and fats acquire by saponification, is chiefly referable to the fixation of the elements of water.

On Corpora Lutea. By Sir Everard Home, *Bart. V.P.R.S.* Read January 14, 1819. [*Phil. Trans.* 1819, *p.* 59.]

In this paper the author describes the origin, growth, use, and decay of the Corpora lutea. The ovarium, before puberty, is a loose, open texture, in which are a number of globular cells. After puberty, the Corpus luteum forms in the substance of the ovarium. In the cow it appears, when magnified, as a mass of convolutions, somewhat like the brain. Sir Everard then proceeds to describe the drawings which accompany this paper, and of which the object is to show that the Corpora lutea are the structures in which the ova are formed; that they exist previous to, and perfectly independent of, sexual intercourse; and that, when they have fulfilled their office of forming ova, they are destroyed by absorption, whether the ova are impregnated or not.

On examining the appearance of the Corpora lutea before and after impregnation, it appears probable that impregnation is necessary for the expulsion of the ovum; but when impregnation does not take place, the ovum appears to remain in the cavity of the Corpus luteum. Hence it may be concluded, that impregnation takes place in the ovarium itself.

Remarks on the Probabilities of Error in Physical Observations, and on the Density of the Earth, considered, especially with regard to the Reduction of Experiments on the Pendulum. In a Letter to Capt. Henry Kater, *F.R.S. By* Thomas Young, *M.D. For. Sec. R.S.* Read January 21, 1819. [*Phil. Trans.* 1819, *p.* 70.]

In the first section of this letter, Dr. Young proceeds to examine in what manner the apparent constancy of many general results, subject to numerous causes of diversity, may be best explained; and shows that the combination of many independent causes of error, each liable to incessant fluctuation, has a natural tendency, dependent on their multiplicity and independence, to diminish the aggregate variation of their joint effect; a position illustrated by the simple case of supposing an equal large number of black and white balls to be thrown into a box, and 100 of them to be drawn out at once or in succession; when it is demonstrated that there is 1 chance in $12\frac{1}{2}$;